Weed, C. H. The mission of the birds.

HARVARD UNIVERSITY.

LIBRARY

OF THE

MUSEUM OF COMPARATIVE ZOÖLOGY

6L.064

GIFT OF

Nathan Banks.

February 14, 1923.

61.064

FEB 14 1923

THE MISSION OF THE BIRDS

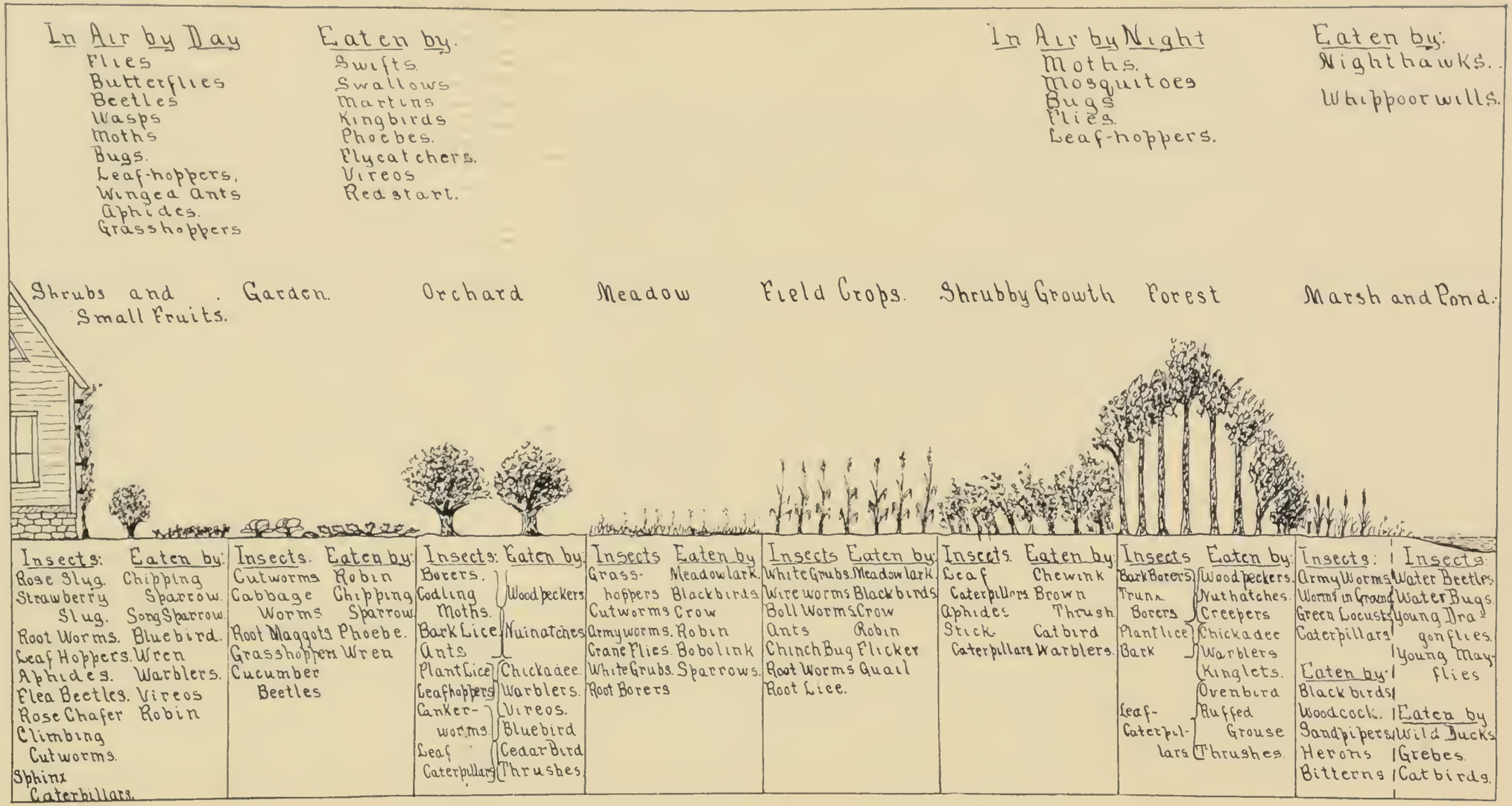
By CLARENCE MOORES WEED

New Hampshire College Agricultural Experiment Station

DURHAM

Nature Study Leaflet No. 2

April, 1902



The Relations of Birds and Insects on a New Hampshire Farm

NATURE STUDIES

FOR

NEW HAMPSHIRE SCHOOLS

No. 2 **Spring, Summer, or Autumn**

THE MISSION OF THE BIRDS

BY CLARENCE MOORES WEED

The living things in this world of ours are related to each other in numberless ways. In the last analysis animals depend upon plants for food, but to a very great extent this food supply is indirect, animals eating animals through varying degrees before the plant-feeding animal is reached. In a general way we may say that the world of birds obtains its food from the world of insects, for while some birds live wholly upon vegetation, and others wholly upon animals other than insects, the great majority of birds find among the insects their staple diet. It is the purpose of this leaflet to indicate how close this relation is, and to show how it may be made an excellent topic for at least part of a term's work in spring or autumn in Nature Study in our New Hampshire schools in any grade above the fourth. The special relation between birds and seeds is reserved for a leaflet upon Winter Birds.

The topic should be developed through the observations of the children. Set aside if possible a part of the blackboard for this purpose, drawing upon it such a sketchy outline of the different parts of a New Hampshire farm as is shown on the opposite page. If blackboard space is not available make the sketch upon a large sheet of paper or cardboard fastened to the wall. Then ask the children to observe what sorts of insects are especially found in the different situations, and also what birds they can see in the same places. As the observations are reported write them in the proper place on the board so that after some weeks you shall get some such

diagram as this. But do not copy this outline on the board; *let the children make their own discoveries.* When the topic is fairly worked out, but not before, you might, if you choose, read to them the following paragraphs. Then drop the subject and take up something else.

The Birds and the Insects

One whose house is surrounded by lawns and shrubbery, with a garden near at hand, need not go out of doors in order to see evidence of the way in which the world of birds is set over against the world of insects to keep them in check. The robins on the lawn are searching for angle worms—which are not insects—and for cutworms, which are insects. The chipping sparrow and the wren in the shrubbery are always searching for insect food. The bluebird upon the post and the phœbe upon the bare twig are on a similar quest, while the warblers and the vireos darting through the foliage are after tiny insects.

Female Red-winged Blackbird

The birds likewise watch over the orchard, feeding freely upon the enemies of apple and other fruit trees. The trunks of these trees are often attacked by borers which gnaw holes in the bark and wood, causing the death of the trees. The woodpeckers are always at work hunting for these borers and bringing them from their hiding places by means of their barbed tongues. On the outside of the bark of the trunk and branches the bark-lice and twig-hoppers are at work, and these are sought for by the nuthatches, creepers, and chickadees. In winter also the bark is the hiding-place for the hibernating stages of many insects, like the plant-lice or aphides, which in summer feed upon the leaves. These are also devoured by the birds named. In a single day a

chickadee will sometimes eat more than four hundred eggs of the apple plant-louse, while throughout the winter one will destroy an immense number of the eggs of the cankerworm, when these are abundant. As soon in spring as the leaves begin to unfold they are attacked by the plant-lice that have survived the winter as well as by many sorts of caterpillars and other insects; the notorious cankerworm is one of the worst of these. But a host of birds come to the rescue of the trees; the aphides are hunted by the beautiful little warblers which go northward in early May, when aphides are thick upon the unfolding leaves. The cankerworms and other similar leaf-eating caterpillars form the favorite food of many sorts of birds: Robins, catbirds, brown thrushes, bluebirds, warblers, vireos, cedarbirds, sparrows, orioles, and flycatchers all devour them.

The Kingbird

Passing now to the meadows we find a rather specialized condition as to insects. The grass plants are low-growing, and have a comparatively restricted set of enemies. These, however, are sufficiently numerous to destroy the crop when not molested by their bird enemies. The roots of grasses are commonly attacked by white grubs—the destructive larvæ of the common May beetles or June bugs—as well as by wireworms—the larvæ of the click beetles—and plant-lice or aphides which are fostered and cared for by various species of ants. The part of the plant just below the soil surface is sometimes attacked by meadow maggots—the peculiar larvæ of the crane-flies and their allies—while various crown and root borers affect clover and timothy or herdsgrass. Just above the soil surface the fatal work of the cutworms and army worms is done, while still higher up the effect of the grasshoppers and chinch-bugs is likely to be seen.

Set over against these meadow pests we have the blackbirds,

crows, robins, meadow larks, flickers, sparrows, and quail. Some of these birds have specialties in their meadow diet: in early spring the robin feeds very largely upon one of the smaller species of meadow maggots—the larvæ of the bibio fly; the flicker feeds more freely upon ants than upon any other insects; the bobwhite or quail is one of the comparatively few birds that seems to esteem the chinch bug as a source of food. The blackbirds and crows are fond of white grubs, while all these birds and many others feed freely upon army-worms, cutworms, and grasshoppers.

The condition in that part of the farm devoted to field crops is similar to that of the meadow. The insect pests are much the same and the birds that check them are very similar.

Photo by Ned Dearborn
Cedarbird at Nest

When we reach the shrubby growth along the border of the woods we come to a place where insect life is very abundant. The grassy growth scattered here and there in the more open spaces furnishes food for many sorts of insects, while the ground beneath the denser foliage is the hiding-place of many sorts that come from the bark and leaves above. The trunks and branches of the shrubs and small trees furnish subsistence to hordes of insects, while the leaves yield an abundant food to myriads of others. The most characteristic bird of these woodland borders is the chewink, or towhee bunting, often called the ground robin from its living so largely upon the ground beneath the shrubby growth, where it is continually searching for insect food. The brown thrasher frequents the same situation, gleaning food also among the twigs and leaves. The catbird is also commonly present, especially if a body of water is near at hand, in which case the Maryland yellow throat will also generally be found.

And in the branches and among the leaves sparrows and warblers are abundant, ever searching for the tiny foes to plant-life.

The transition from the shrubby border of the forest to the forest proper is generally gradual, and there is more or less connection between the insect life as well as the bird life in the two areas. On the whole insects exist in the forest in less variety than in the shrubby growth or the open fields. As a rule there is little food for them on the ground beneath dense woods, so that their food supply is limited to the trees themselves. Upon these, however, they are very often destructively abundant. The bark is full of the burrows of various beetles, some species of which go deep into the trunk or larger branches, while the twigs and leaves are infested by many sorts of bark-lice, plant-lice and caterpillars. Of the leaf-feeding caterpillars, some go to the ground to pupate, and there they form an important part of the food of the ruffed grouse, which is one of the few birds that searches the soil surface in dense woods. The woodpeckers look after the bark and trunk borers, assisted more or less by the nuthatches and creepers; while the plant-lice and the leaf caterpillars are always in danger from the hungry beaks of the chickadees, kinglets, warblers, vireos, ovenbirds and thrushes.

The Yellow Warbler

Even the comparatively few insects found in marshes, along the shores of ponds, and living in the water itself are not free from bird attack. The blackbirds of various kinds, the numerous sparrows that live in lowlands, the snipe, woodcock, sandpipers, plovers, and rails, the herons and bitterns, the ducks, coots and grebes, all find in these insects part of their diet. The catbird makes a specialty of catching dragon flies just after they have emerged from their nymph stage, when they are waiting for the wings to harden before

flying away. Prof. F. H. Herrick has found that the young catbirds in the nests are fed freely with these soft-bodied dragon-flies. The Maryland yellow throat and the swamp-sparrow are especially likely to be seen in the region of running or standing water, getting much of their food from the insects found there.

Practically all of the insects that prey upon vegetation exist in one stage of life as winged adults which fly through the air either during the day or during the night. At such times they are liable to attack by certain birds which patrol the air with great efficiency. By day the general regions of the air are supervised by the swifts, swallows, and martins. Over field, wood, orchard, meadow, lake, and pond these aërial police are constantly on the alert to check the careers of the evildoers. When the insects fly high the swallows are after them in the upper air; when they fly low the swallows skim the surface of soil and water to catch them. Flies and butterflies, beetles and bugs, ants and aphides, grasshoppers and leafhoppers, mosquitoes and moths, all fall victims to these fowls of the air.

But the birds just named are by no means the only watchers of the flying insects. The space near the trees and fences, the stumps and rocky cliffs, is looked after by those birds which rest quietly on some perch until an insect comes near and then flies after it. With us the most important of these flycatchers are the kingbird, the phœbe, and the crested flycatcher, although the wood pewee and various other species also render efficient assistance. And even the space within the limits of the tree branches is looked after by the vireos and warblers, especially the redstart, the latter bird having well been called "the flycatcher of the inner treetops."

A very large proportion of the winged insects fly by night. But even then they are not exempt from destruction by birds. In the twilight as well as the deeper shades of night the night hawks and whippoorwills are searching the air for insect food. Almost any winged insect, from the great Luna moth to the smaller flies, is liable to be taken by the capacious jaws of these silent messengers.

The Hawks and Owls

While insects are by far the most destructive animals with which the birds have to do, they are by no means the only ones. The great group of birds of prey, of which the hawks and owls are the

most familiar examples, serve a very useful purpose in keeping in check the mice and rats which otherwise would prove very troublesome. In some regions where the hawks and owls have been ruthlessly destroyed the damage from field mice has been very great. The indiscriminate destruction of all sorts of hawks and owls simply because some hawks and owls catch poultry is a foolish and wasteful practice. As a matter of fact the smaller owls and the most common hawks feed upon mice and insects and seldom or never take poultry. For example, the little screech owl is perhaps our most common owl. Most people think it a privilege to shoot it on sight. But its food, as determined by those who have studied it long and carefully, consists chiefly of mice and insects. "At nightfall," writes Dr. A. K. Fisher, "these birds begin their rounds, inspecting the vicinity of farmhouses, barns, and corncribs, making trips through the orchards and nurseries, gliding silently across the meadows or encircling the stacks of grain in search of mice and insects. Thousands upon thousands of mice of different kinds thus fall victims to their industry. Their economic relations are therefore of the greatest importance, particularly on account of the abundance of the species in many farming districts, and whoever destroys them through ignorance or prejudice should be severely condemned."

Head of Hawk

"Those who have rambled much in the country in the clear winter mornings must have noticed the tracks of mice which often form networks in the snow, crossing and recrossing, passing in and out of walls and stacks, or converging toward some choice bit of food—all tending to show how active these little rodents are during the night, a period when most of the world sleeps. Occasionally a track stops abruptly, and while the observer is trying to read

more of the history written in the snow, his eyes catch the faint impression of a pair of wing-tips near where the trail ends, and instantly he recognizes that a tragedy has been enacted."

The commoner hawks are also beneficial, destroying great numbers of mice and insects. It is all right to trap or shoot a hawk or owl that is known to rob the poultry yard, but it is a mistake to destroy all sorts of these birds indiscriminately.

Adaptation of Structure to Functions

It would be a pity to make this study of the relation of birds to insects and other animals without calling attention at the same time to the adaptation of the structure of each bird to the feeding habits which so largely determine its mode of life. There is not space here for the full discussion of this subject I should like to give, but a few lines of observation may be briefly indicated.

The bird takes its food with or in its beak: Notice the strong, solid beak of the robin, the crow, and other birds that get food on the ground; the chisel-like beak of the woodpeckers; the very wide beak of the swallows, the night hawk, and the whippoorwill; the flat beak of the flycatchers; the pointed beak of the warblers; the long, probing beak of the woodcock, plovers, and sandpipers; the spear-like beak of the herons and bitterns; the wide, flat beak of the ducks, and the hooked beak of the hawks and owls. Each of these is well adapted to getting the sort of food the bird requires.

Head of Shrike

The manner and habits of flight of the bird are largely determined by the nature of its food: Notice the comparatively labored flight of the robin, crow, and other birds with large bodies; the quick, undulatory motion of the woodpeckers; the short, strong flights of the flycatchers; the easy, light-bodied flight of the swal-

lows, night hawk, and whippoorwill; the restless motion of the warblers; and the lazy soaring of the hawks. See how the relation of wings to body in every case is adapted to the feeding habits of the bird.

And in like manner the legs and feet are adapted to the mode of life: Notice the strong legs and well-developed toes of the birds that live on the ground in fields and meadows; the peculiar feet of the woodpeckers with which they climb vertical surfaces; the long legs of the plovers and sandpipers, the herons and bitterns; the webbed feet of the ducks, and the tearing talons of the birds of prey.

In the study of these adaptations let the children see for themselves, and let them all work out in their own minds the adaptation of structure to function. For in all our nature study our chief privilege is to lead the *children to see and to see why*. The importance of a bit of truth is greatly increased when we are able to see its relations to other bits of truth.

Helps to the Study of Birds

Books about birds are very numerous, although there is none as yet published which deals specifically with their economic relations. Every teacher who attempts to do anything with bird study for her pupils should have upon her desk some illustrated guide to our common birds. The one that is likely to be most useful is Chapman's "Bird Life," with colored plates, published by D. Appleton & Co. at $2.00. School authorities should provide one of these books for each desk where nature study is to be taught. Herrick's "Home Life of Wild Birds" (Putnams, $2.50), will also be especially helpful in leading to the observations of the nesting habits. The books of Bradford Torrey and Frank Bolles (Houghton, Mifflin & Co.), as well as of Schuyler Mathews (D. Appleton & Co.), deal very largely with the birds of New Hampshire, and consequently are of special value for use in our state.

The Lesson in It All

The study thus outlined of the Mission of the Birds will have failed to accomplish its most important results if the pupils do not get from it a greater respect for the world of birds, a deeper interest in their welfare, and a larger sense of the unity of that world of liv-

ing things of which man is the highest example. A discussion of the methods of encouraging useful birds should follow as a natural consequence of the study,—and this should lead to the erection of bird houses, the planting of Russian mulberry or other trees to furnish food for the birds, and especially to checking the wanton destruction of bird life.

The Blackburnian Warbler.

ord Bros.
lakers
use, N. Y.
AN 21, 1908